Permit Fact Sheet

General Information

Permit Number:	WI-0020311-10-0	
Permittee Name:	CITY OF MELLEN	
Address:	PO BOX 708 102 E BENNETT ST	
City/State/Zip:	MELLEN WI 54546	
Discharge Location:	500 Christ Lutz Drive, Mellen WI (NW ¼ Section 6: T44N-R02W)	
Receiving Water:	The Bad River in Ashland County within the Upper Bad River Watershed in the Lake Superior Drainage Basin	
StreamFlow ($Q_{7,10}$):	5.4 cfs	
Stream Classification:	Fish and aquatic life, cold water communities under Wis. Adm. Code NR 104 (Class III trout stream)	
Wild Rice Impacts:	No impacts identified at this location. Wild rice beds are documented downstream within the Bad River Slough (associated with the mouth of the river approximately 43.5 river miles downstream). • The waste meets NR 105.04 Wis. Adm. Code. • The wastewater permit has been in existence over a long period (over 40 years). • The effluent volumes are low. • The distance to wild rice waters is great. • The health of said rice beds is classified as exceptional (tribal website).	
Design Flow(s)	Daily Maximum	0.637 MGD
	Weekly Maximum	0.480 MGD
	Monthly Maximum	0.314 MGD
	Annual Average	0.205 MGD
Significant Industrial Loading?	No	
Operator at Proper Grade?	Yes	
Approved Pretreatment Program?	N/A	

Facility Description

The City of Mellen wastewater treatment facility serves a population of approximately 731 with no significant industrial contributors. The annual average design flow is 205,000 gallons per day, with actual flows averaging 193,000 gallons per day over the past five years (June 2014 – June 2019). Treatment consists of two aerated lagoons operated one after another (in series). Within these ponds naturally occurring bacteria and organisms already present in the wastewater break down the organic matter. The water is further treated in a third non-aerated pond until the wastewater can meet discharge standards. Prior to discharge to the Bad River the treated wastewater (called effluent) is disinfected seasonally (May through September) with a UV system.

Proposed Permit Reissuance

The Department anticipates an effective date of April 1, 2020 for the proposed permit. Therefore, to allow a full permit term of five years, the proposed permit's expiration date is March 31, 2025. If the permit reissuance process takes more or less time than anticipated, the permit's dates of effectiveness and expiration may be changed accordingly.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
701	INFLUENT An average of 0.193 MGD (June 2014- June 2019)	Representative samples shall be collected from the influent to Cell #1.
002	EFFLUENT An average of 0.199 MGD (June 2014- June 2019)	Representative samples shall be collected in the control building after the disinfection unit prior to discharge to the Bad River.
004	SLUDGE An estimated 443 tons was removed in 2017.	Samples shall be collected at a point and in a manner that will yield sample results representative of the sludge being tested. Sample collection shall be taken at a time appropriate for the specific test. Removal and disposal of sludge is not anticipated during this permit term.
102	INPLANT This is an operational parameter only.	At least one field blank shall be collected for each day a sample of mercury is collected from Outfall 002. The purpose of the field blank is to determine if the field or sample transporting procedures and environment have contaminated the sample.

Substantial Compliance Determination

	Compliance?	Comments
Discharge limits	No	Chronic issues with BOD violations were reported following substantial compliance (1/2018) of facility upgrade project. Initially there were issues associated with startup of the new ponds. Evaluation per NR210.07(4) concluded CBOD limits should be used instead of BOD due to influence from nitrifiers/NBOD. This will continue to be evaluated during the next permit term and will be addressed as needed through stepped enforcement. Fecal violations occurred in 2018 following startup of the upgraded pond facility; results from 2019 indicate the limits are consistently being met.
Sampling/testing requirements	Yes	
Groundwater standards	N/A	
Reporting requirements	Yes	Late DMRs throughout permit term. This was addressed during 2018 compliance inspection.

Compliance schedules	Yes	Temp reporting/evaluation rec'd. Sludge Profile rec'd. During permit term, sludge was removed during facility upgrade project.	
Management plan	N/A		
Operator at proper grade	Yes	Disinfection subclass D certification was obtained. Subclass SS (collection system) due by end of next permit term.	
Other	Current Plant Subclass: A4, Stabilization Ponds and Aerated Lagoons; D. Disinfection; SS. Sanitary Sewage Collection System		
Enforcement considerations			
In substantial compliance?	Yes	5/1/2018 – compliance inspection and construction completion meeting. 8/28/2019 – compliance inspection	
	Concurrence: Eric de Veneica		Date: 9/4/2019

1 Influent - Proposed Monitoring

Sample Point Number: 701- INFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
BOD5, Total		mg/L	Weekly	Grab	
CBOD5		mg/L	Weekly	Grab	
Suspended Solids, Total		mg/L	Weekly	Grab	
Mercury, Total Recoverable		ng/L	Quarterly	Grab	See the Mercury subsection for more information.

Changes from Previous Permit & Explanation of Limits and Monitoring Requirements:

The parameters are standard monitoring requirements and frequency for minor municipal facilities with a biological treatment plant. Tracking of BOD_5, and Suspended Solids are required for percent removal requirements found in s. NR 210.05, Wis. Adm. Code.

BOD5/CBOD5 - The permittee provided the paired data needed to apply for a variance as provided in Wis. Adm. Code NR 210.07 (4) and (5) to replace BOD limits with CBOD limits. Influent monitoring for BOD5 and CBOD5 is required as part of the variance. Monitoring for CBOD5 satisfies the percent removal requirements of NR 210.05 Wis. Adm. Code, and monitoring for BOD5 satisfies operational requirements for the Compliance Maintenance Annual Report (CMAR).

Mercury - Quarterly monitoring for total recoverable mercury has been included in the permit influent section as required in NR 106, Wis. Adm. Code. Monitoring for influent mercury helps determine removal rates in the treatment system.

2 Inplant - Proposed Monitoring and Limitations

Sample Point Number: 102- FIELD BLANK

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Quarterly	Blank	See the "Mercury Monitoring" subsection for more information.

Changes from Previous Permit & Explanation of Limits and Monitoring Requirements:

At least one field blank shall be collected for each set of mercury samples (a set of samples may include any combination of influent, effluent, or other samples collected on the same day). The purpose of the field blank is to determine if the field or sample transporting procedures and environment have contaminated the sample.

3 Surface Water - Proposed Monitoring and Limitations

Sample Point Number: 002- SURFACE WATER

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
CBOD5	Monthly Avg	25 mg/L	Weekly	3-Hr Comp	
CBOD5	Weekly Avg	40 mg/L	Weekly	3-Hr Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	Weekly	3-Hr Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	Weekly	3-Hr Comp	
pH Field	Daily Max	9.0 su	Weekly	Grab	
pH Field	Daily Min	6.0 su	Weekly	Grab	
Fecal Coliform	Geometric Mean - Monthly	400 #/100 ml	Weekly	Grab	Limit and monitoring effective May through September.
Fecal Coliform	Geometric Mean - Wkly	656 #/100 ml	Weekly	Grab	Limit and monitoring effective May through

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					September.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	32 mg/L	Weekly	3-Hr Comp	Limit effective April through May.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	89 mg/L	Weekly	3-Hr Comp	Limit effective June through September.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	37 mg/L	Weekly	3-Hr Comp	Limit effective October through March.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	47 mg/L	Weekly	3-Hr Comp	Limit effective April through May.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	108 mg/L	Weekly	3-Hr Comp	Limit effective June through September.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	54 mg/L	Weekly	3-Hr Comp	Limit effective October through March.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	Weekly	3-Hr Comp	See the "Ammonia Limitation" subsection for more information.
Nitrogen, Ammonia Variable Limit		mg/L	Weekly	Calculated	See the "Ammonia Limitation" subsection for more information.
Sulfate, Total		mg/L	Quarterly	3-Hr Comp	
Mercury, Total Recoverable	Daily Max	6.5 ng/L	Quarterly	Grab	VARIANCE LIMIT See the "Mercury Variance" subsection for more information.
Temperature Maximum		deg F	3/Week	Multiple Grab	Monitoring is required during the month of August 2022.
Phosphorus, Total		mg/L	Monthly	3-Hr Comp	Monitoring is required during the 2022 calendar year.

Changes from Previous Permit & Explanation of Limits and Monitoring Requirements:

The monitoring frequency and limits for **Flow**, **Suspended Solids**, **pH** and **Disinfection** have not changed from the previous permit term. All categorical limits are based on NR 104.02 and NR 210 (Subchapter II) Wis. Adm. Code. More information on calculating limits for these parameters as well as **Ammonia**, **Phosphorus**, **Temperature**, and **WET Testing** can be found in the "Water Quality-Based Effluent Limitations for the City of Mellen (WI-0020311)" memo dated June 19, 2019.

CBOD5 – The City applied for and received a CBOD5 variance per NR 210.5 (1)(d). The facility was successful in showing that BOD5 data was flawed as the result of being inflated by at least partial nitrification that occurs in the BOD5 test. Nitrification gives erroneously high results therefore falsely indicating noncompliance.

Total Suspended Solids - Categorical limits for TSS are required per NR 104 and 210.05, Wis. Adm. Code.

pH – Categorical limits for pH are required per NR 210 (Subchapter II) Wis. Adm. Code.

Fecal Coliform – Disinfection requirements and categorical limits for fecal coliform can be found in NR 210.06 Wis. Adm. Code.

Ammonia – Using current acute and chronic ammonia toxicity criteria found in Tables 2C and 4B of NR 105 Wis. Adm. Code (effective March 1, 2004) and limit calculating procedures (Subchapter IV of 106, Wis. Adm. Code (update effective September 1, 2016)) ammonia limitations were calculated for the facility. Daily maximum limits expressed as variable limits are required. Sample results for pH shall be used to calculate the variable limit (see the Maximum Effluent Ammonia Concentration Limits table at the end of this section). The table now includes limit values from 6.0 s.u. to 9.0 s.u. because the winter 40 mg/L and the summer 20 mg/L threshold values for municipal treatment facilities (NR 106.33(2) Wis. Adm. Code) are no longer permitted. When possible total ammonia (NH3-N) sampling shall occur on the same day pH levels are monitored. Report the applicable variable limit on the Discharge Monitoring Report (DMR) in the Ammonia Variable Limit column.

Weekly Average limits (47 mg/L (April-May), 108 mg/L (June-September) and 54 mg/L (October-March)) and Monthly Average (32 mg/L (April-May), 89 mg/L (June-September) and 37 mg/L (October-March)) limits were considered. There isn't reasonable potential for any of the limits to be exceeded. But due to regulatory changes to NR 205.065, Wis. Adm. Code, that became effective September 1, 2016 limits in this permit need to be expressed as weekly average and monthly average limits whenever practicable. These changes are based on 40 CFR 122.45(d). In order to comply with this regulation, all calculated Weekly and Monthly Average limits have been included.

Variable Limits Table

Daily maximum ammonia limits based on Effluent pH

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 < pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

Sulfate – Sulfate monitoring shall continue this permit term. Monthly monitoring during the last permit term provided a base line average of 16 mg/L. Due to consistent results the monitoring frequency has been reduced to quarterly.

In the Bad River Band of the Lake Superior Tribe of Chippewa Indians Water Quality Standards (WQS) effective July 6, 2011, there is a narrative criterion for sulfate that is applicable to the Bad River (provision E.6.ii.c.). Based on the monitoring results, a numeric limit may need to be derived and incorporated into this permit in the future to ensure this narrative criterion is being met. The Bad River WQS can be viewed at http://www.badriver-nsn.gov/images/stories/docs/bad%20river%20wqs_final_7-6-11a.pdf . Sulfate sample results were provided to the Tribe by the department on a monthly basis. Due to potential department staff turnover and changes in employee responsibilities over the permit period, long-term reporting of sample data will be suspended. All monitoring data is

subject to open records requests, the Tribe may make data requests as needed or obtain information through the EPA database ECHO at https://echo.epa.gov.

Mercury – (PENDING EPA APPROVAL) A monthly average limit set equal to the wildlife criteria for mercury (1.3 ng/L), is required at the facility. The Mellen Wastewater Treatment Facility has requested a variance to the mercury limit. An alternative mercury effluent limitation under s. 106.145, Wisconsin Administrative Code represents a variance to water quality standards authorized by s. 283.15, Wis. Stats. This request has been granted and the permit includes a 6.5 ng/L daily maximum limit. The variance limitation is consistent with the 1-day P99. During the previous permit term, a memorandum of understanding with the department was developed. As part of the agreement the facility began working toward mercury reduction. The City worked with homeowners, the local school, nursing home, dental office and industries through contacts and educational materials. The City also promoted and participated in the Ashland county Clean Sweep program. During this permit term, the City will continue their education program and will sample the industries, schools, septic haulers and nursing home annually to identify potential contributors.

The granting of this variance to the City of Mellen Wastewater Treatment Facility shall apply only to the 5-year permit term of the proposed WPDES permit. The permittee shall continue to implement a mercury pollutant minimization program with the addition of permit required submittal of annual reports.

Thermal – Using the administrative rules for thermal discharges detailed in NR 102 Subchapter II Water Quality Standards for Temperature and NR 106 Subchapter V Effluent Limitations for Temperature effective October 2010, effluent thermal limits were calculated. The calculated thermal limits for the Bad River indicate daily and weekly temperature limits vary by month. Comparison with facility data shows a slight exceedance of the weekly average limit during the month of August (71 def F). Therefore, a weekly limit may be applicable, but NR 106.56(12) Wis. Adm. Code allows the facility to collect effluent data to determine if the limitation is appropriate. The facility shall collect samples three times a week during the month of August 2022. The data will be evaluated to see if the limitation shall take effect in the next permit reissuance.

Phosphorus - Phosphorus requirements are based on the Phosphorus Rules that became effective 12/1/2010 as detailed in NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. Chapter NR 217 of the Wis. Adm. Code addresses point source dischargers of phosphorus to surface waters. Currently in NR 217 Wis. Adm. Code there are two methods used to determine if a phosphorus limit is needed: a technology based effluent limit (TBEL) and a water quality based effluent limit (WQBEL). A TBEL of 1 mg/L is not needed because the facility discharges less than the threshold of 150 pounds per month. Based on the size and classification of the stream, the water quality criteria for the Bad River is 75 ug/L and the calculated WQBEL is 1.8 mg/L. A reasonable potential analysis was completed and the 30-day p99 value (1.47 mg/L) is lower than the WQBEL, therefore a water quality-based limit for phosphorus is not required.

Whole Effluent Toxicity (WET) Testing - As toxicity potential increases, additional monitoring of the wastewater as a whole is required to assure toxicity is not affecting aquatic organisms over the short (acute) and long (chronic) term. This is a minor municipal facility comprised of domestic wastewater, with no history of WET failures and no toxic compounds detected at levels of concern. There is a very low risk of toxicity, therefore; based on best available information WET testing is not required this permit term.

4 Land Application - Proposed Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
004	B	Liquid	Fecal Coliform	Sludge is not scheduled for removal this permit term		
Does sludge management demonstrate compliance? Yes						

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No, during the most recent round of sampling, the gross alpha was below the level of detection which correlates to a Radium-226 level below 2 pCi/liter. If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility						
Is a priority pollutant scan required? No Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

Sample Point Number: 004- LAGOON SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Once	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Once	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Once	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Once	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Once	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Once	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Once	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Once	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Once	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Once	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Once	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Once	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Once	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Once	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Once	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	

Changes from Previous Permit & Explanation of Limits and Monitoring Requirements:

The requirements for land application of municipal sludge are determined in accordance with ch. NR 204 Wis. Adm. Code.

Water Extractable Phosphorus - Water extractable phosphorus (WEP) is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While a total P may be significant, the WEP may show that only a small percentage of the P is available to plants because of factors such as treatment processes and chemical addition that "tie-up" phosphorus limiting the amount of phosphorus that is plant available. As part of the Wisconsin's nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

5 Schedules

5.1 Mercury Pollutant Minimization Program

As a condition of the variance to the water quality based effluent limitation(s) for mercury granted in accordance with s. NR 106.145(6), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Annual Mercury Progress Reports: Submit an annual mercury progress report. The annual mercury progress report shall: Indicate which mercury pollutant minimization activities or activities outlined in the approved Pollutant Minimization Plan have been implemented; Include an analysis of trends in quarterly and annual total effluent mercury concentrations based on mercury sampling; and Include an analysis of how influent and effluent mercury varies with time and with significant loading of mercury such as loads from industries into the collection system. The first annual mercury progress report is to be submitted by the Due Date.	03/31/2021
Annual Mercury Progress Report #2: Submit a mercury progress report as defined above.	03/31/2022
Annual Mercury Progress Report #3: Submit a mercury progress report as defined above.	03/31/2023
Annual Mercury Progress Report #4: Submit a mercury progress report as defined above.	03/31/2024
Final Mercury Report: Submit a final report documenting the success in reducing mercury concentrations in the effluent, as well as the anticipated future reduction in mercury sources and mercury effluent concentrations. The report shall summarize mercury pollutant minimization activities that have been implemented during the current permit term and state which, if any, pollutant minimization activities from the approved pollutant minimization plan were not pursued and why. The report shall include an analysis of trends in quarterly and annual total effluent mercury concentrations based on mercury sampling during the current permit term. The report shall also include an analysis of how influent and effluent mercury varies with time and with significant loading of mercury such as loads from industries into the collection system. If the permittee intends to reapply for a mercury variance per s. NR 106.145, Wis. Adm. Code, for the reissued permit, a detailed pollutant minimization plan outlining the pollutant minimization activities proposed for the upcoming permit term shall be submitted along with the final report.	09/30/2024
Annual Mercury Reports After Permit Expiration: In the event that this permit is not reissued on time,	

the permittee shall continue to submit annual mercury reports each year covering pollutant minimization activities implemented and mercury concentration trends.	

Explanation of Compliance Schedules

Mercury Pollutant Minimization Program – (PENDING EPA APPROVAL) A variance from the mercury Water Quality Based Effluent Limits has been applied for and approved. As a condition of that variance the permittee is required to investigate and reduce the sources of the metal.

Other Comments:

The Bad River flows through reservation property, therefore the effluent discharge from the City of Mellen is also subject to tribal water quality criteria.

Attachments:

Water Flow Schematic(s)

"Water Quality-Based Effluent Limitations for the City of Mellen (WI-0020311)" memo originally dated June 19, 2019 was corrected for a typographic error on September 24, 2019

Proposed Expiration Date:

March 31, 2025

Justification Of Any Waivers From Permit Application Requirements

N/A

Prepared By:

Sheri A. Snowbank Wastewater Specialist

Date: August 2, 2019

cc: Eric de Venecia, Superior